



Diffuse soil CO₂ degassing from Linosa island

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Abstract

Herein, we present and discuss the result of 148 measurements of soil CO₂ flux performed for the first time in Linosa island (Sicily Channel, Italy), a Plio-Pleistocene volcanic complex no longer active but still of interest owing to its location within a seismically active portion of the Sicily Channel rift system. The main purpose of this survey was to assess the occurrence of CO₂ soil degassing, and compare flux estimations from this island with data of soil degassing from worldwide active volcanic as well as non-volcanic areas. To this aim soil CO₂ fluxes were measured over a surface of about 4.2 km² covering ~80% of the island. The soil CO₂ degassing was observed to be mainly concentrated in the eastern part of the island likely due to volcano-tectonic lineaments, the presence of which is in good agreement with the known predominant regional faults system. Then, the collected data were interpreted using sequential Gaussian simulation that allowed estimating the total CO₂ emissions of the island. Results show low levels of CO₂ emissions from the soil of the island (~55 ton d⁻¹) compared with CO₂ emissions of currently active volcanic areas, such as Miyakejima (Japan) and Vulcano (Italy). Results from this study suggest that soil degassing in Linosa is mainly fed by superficial organic activity with a moderate contribution of a deep CO₂ likely driven by NW-SE trending active tectonic structures in the eastern part of the island.

Keywords

Soil CO₂ flux; Linosa; Sequential Gaussian simulation

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References

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